UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/748,415	12/30/2003	David B. Minturn	INTCP005	8119

45460   7590   10/09/2007
JUNG-HUA KUO ATTORNEY AT LAW
C/OINTELLEVATE
P. O. BOX 52050
MINNEAPOLIS, MN 55402

EXAMINER
MIRZADEGAN, SAEED S

ART UNIT	PAPER NUMBER
2144	

MAIL DATE	DELIVERY MODE
10/09/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

<table>
<tr><td rowspan="2">Office Action Summary</td><td>Application No.
10/748,415</td><td>Applicant(s)
MINTURN, DAVID B.</td></tr>
<tr><td>Examiner
Saeed S. Mirzadegan</td><td>Art Unit
2144</td><td></td></tr>
</table>

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>30 December 2003</u>.

2a)☐ This action is **FINAL**.　　2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-30</u> is/are pending in the application.

　　4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-30</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>30 December 2003</u> is/are: a)☐ accepted or b)☒ objected to by the Examiner.

　　Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

　　Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

　　a)☐ All　b)☐ Some * c)☐ None of:

　　　1.☐ Certified copies of the priority documents have been received.

　　　2.☐ Certified copies of the priority documents have been received in Application No. _____.

　　　3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

　　* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
　　Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
　　Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Drawings

1.   The drawings are objected to because of the following

a.   Fig. 3, 120 is labeled as "TCP Hash Node Table", however the disclosure

recites "host hash node table 120".

b.   Fig 3, 130 is labeled as "TCB Context Table", however the disclosure

recites "host TCP context table 130".

c.   Fig. 4, 142 is labeled as "Hash Table Pages Table", however the

disclosure recites "NIC resident hash table pages table 142" as well as "NIC hash

table pages table 142".

d.   Fig. 4, 144 is labeled as "TCB Context Table Pages Table", however the

disclosure recites "NIC TCB Context Table Pages Table 144".

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in

reply to the Office action to avoid abandonment of the application. Any amended

replacement drawing sheet should include all of the figures appearing on the

immediate prior version of the sheet, even if only one figure is being amended.

The figure or figure number of an amended drawing should not be labeled as

"amended." If a drawing figure is to be canceled, the appropriate figure must be

removed from the replacement sheet, and where necessary, the remaining

figures must be renumbered and appropriate changes made to the brief

description of the several views of the drawings for consistency. Additional

replacement sheets may be necessary to show the renumbering of the remaining

figures. Each drawing sheet submitted after the filing date of an application must

be labeled in the top margin as either "Replacement Sheet" or "New Sheet"

pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner,

the applicant will be notified and informed of any required corrective action in the

next Office action. The objection to the drawings will not be held in abeyance.

Specification

2.   The disclosure is objected to because of the following informalities: In numerous

places in the disclosure, tables 120, 130, 142 & 144 are recited with different names. A

consistent naming convention should be adhered to throughout the disclosure for the

aforementioned tables. This consistency is to be maintained as it applies to the drawing

with which they correspond.

Appropriate correction is required.

3.   The disclosure is objected to because of the following informalities: Page 6,

¶0021, line 1 recites "The host hash node table 120 contains a set number (N) TCP

hash node" where it should read "The host hash node table 120 contains a set number

(N) of TCP hash node".

Appropriate correction is required.

4.   The disclosure is objected to because of the following informalities: In Page 7,

¶0024, the applicant recites "For the NIC data structures shown in FIG. 4, the NIC TCP

data structures 140 include a NIC resident hash table pages table 142 and a NIC

resident TCB context table pages table 144. The NIC hash table pages table 142 is a

table in NIC memory containing the physical address of each page of the host TCP

hash node table (reference number 120 in FIG. 3). The NIC TCB context table pages

table 144 is a table in NIC memory containing the physical address of each page of the

host TCB context table (reference number 130 in FIG. 3). The NIC hash table pages

table 142 and the NIC TCB context table pages table 144 have the same number of

entries and each entry may be, for example, 64 bits wide." which indicates that table

142 has the same number of entrees as table 120 which is N entrees, and table 144

has the same number of entrees as table 130 which is Z entrees. It also indicates that

tables 142 and 144 have the same number of entrees therefore Z=N; however based on

Page 6, ¶0022, Z=X * N. Thus unless the applicant is conceding that X=1, the

recitations are inconsistent.

Appropriate correction is required.

Claim Objections

5.   Claims 10 & 17 are objected to because of the following informalities: Claims 10

& 17 recite the limitation "a host memory" page 15, line 1 & page 16, line 16

respectively. The limitation should read "the host memory".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the

subject matter which the applicant regards as his invention

7. Claim 1-30 are rejected under 35 U.S.C. 112, second paragraph, as being

indefinite for failing to particularly point out and distinctly claim the subject matter which

applicant regards as the invention.

8. Claims 1, 8, 22 recite the limitation "a cache line determinator". Neither the

disclosure nor the claim defines this term. All claims dependent on claim 1, 8 & 10 are

also rejected for the same rational.

9. Claims 1, 10, 17 recite the limitation "a cache line". Neither the disclosure nor the

claim defines this term. All claims dependent on claims 1, 10 & 17 are also rejected for

the same rational.

10. Claims 1, 8, 10, 17 & 22 recite the limitation "a context". Neither the disclosure

nor the claim defines this term. All claims dependent on claims 1, 8, 17 & 22 are also

rejected for the same rational.

11. Claim 17 recites the limitation "a network" page 16, line 11. There is insufficient

antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

12.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

13.   Claims 1-3, 6, 7, 10-12, 15-25 & 30 are rejected under 35 U.S.C. 102(b) as being

anticipated by Boucher at al. (US Pat. No. 7174393) hereafter "Boucher".

14.   Regarding Claim 1, Boucher discloses a network interface controller, comprising:

a hashing logic **(Fig. 4C, 32) receive logic** to generate a hashing value from a packet

received from a network **(Col. 10, lines 21-26) a hashing value is generated form the**

packet received form the network, the received packet having a context associated

therewith; a hash table pages table **(Col. 57, lines 38-43) hash table** and a context

table pages table **(Col. 47, lines 40-43) routing table which contains the IP address**

for storing host memory physical page addresses of a host hash table and a host

context table, respectively; and a cache line determinator **(Fig. 1, 30) CPD,** in

communication with the host **(Fig. 1, 20) host,** and the hashing logic **(Fig. 4C, 32)**

receive logic, the cash line determinator **(Fig. 1, 30) CPD,** being configured to

associate the hash value with a host hash table cache line **(Fig. 4C, 62) CCB cache,**

and a host context table cache line in a host memory **(Col. 15, lines 22-25) the**

information may be saved in the file buffer cache on host 152 using the hash table

pages table **(Col. 57, lines 38-43) hash table** and the context table pages table **(Col.**

47, lines 40-43) routing table which contains the IP address, respectively.

15.   Regarding Claim 2, Boucher discloses: the hashing logic is configured to

generate the hashing value from the context associated with the received packet **(Col.**

10, lines 21-26) a hashing value is generated form the packet received form the

network.

16.   Regarding Claim 3, Boucher discloses the invention as substantially claimed.

Boucher further discloses each entry in the hash table pages table and the context table

pages table correspond to a page in the host memory **(Col. 26, line 46-47) complete**

set of TCB's exist in the host memory.

17.   Regarding Claim 6, Boucher discloses the invention as substantially claimed.

Boucher further discloses a receive descriptor associated with the received packet and

to output the receive descriptor to the host **(Col. 12, lines 39-43)**.

18.   Regarding Claim 7, Boucher discloses the invention as substantially claimed.

Boucher further discloses issuing a pre-fetch of the host context table cache line and

the host hash table cache line **(Col. 67, lines 6-12)**.

19.   Claim 10, lists all the same elements of claim 1, but in method form rather than system form. Therefore, the supporting rationale of the rejection to claim 1 applies equally as well to claim 10.

20.   Regarding Claim 11, Boucher discloses the invention as substantially claimed. Boucher further discloses each entry in the hash table pages table and the context table pages table correspond to a page in the host memory **(Col. 26, line 46-47) complete set of TCB's exist in the host memory**.

21.   Regarding Claim 15, Boucher discloses the invention as substantially claimed. Boucher further discloses inserting the host context table cache line and the host hash table cache line into a receive descriptor associated with the received packet; and outputting the receive descriptor to the host. **(Col. 12, lines 39-43)**.

22.   Regarding Claim 16, Boucher discloses the invention as substantially claimed. Boucher further discloses issuing a pre-fetch of the host context table cache line and the host hash table cache line **(Col. 67, lines 6-12)**.

23.   Claim 17, lists all the same elements of claim 10, but in computer readable medium form rather than method form. Therefore, the supporting rationale of the rejection to claim 10 applies equally as well to claim 17.

24.   Claim 20, lists all the same elements of claim 15, but in computer readable

medium form. Therefore, the supporting rationale of the rejection to claim 15 applies

equally as well to claim 20.

25.   Claim 21, lists all the same elements of claim 7, but in computer readable

medium form. Therefore, the supporting rationale of the rejection to claim 7 applies

equally as well to claim 21.

26.   Claim 22, lists all the same elements of claim 1 in system form. Therefore, the

supporting rationale of the rejection to claim 1 applies equally as well to claim 10.

Boucher further discloses a host CPU **(Fig 1, 28) CPU**, a host memory **(Fig. 1, 35)**

storage, a network interface card (NIC) **(Fig. 6, 150) INIC**; a host bus to facilitate the

host cpu, host memory, and the NIC to communicate therebetween **(Fig. 9, 205) PCI**

bus.

27.   Regarding Claim 23, Boucher discloses the invention as substantially claimed.

Boucher further discloses issuing a pre-fetch of the host context table cache line and

the host hash table cache line **(Col. 67, lines 6-12)**.

28.   Regarding Claim 24, Boucher discloses the invention as substantially claimed.

Boucher further discloses the hashing logic **(Fig. 4C, 32) receive logic** is configured to

generate the hashing value from the context associated with the received packet **(Col.**

10, lines 21-26) a hashing value is generated form the packet received form the network.

29.   Regarding Claim 25, Boucher discloses the invention as substantially claimed. Boucher further discloses each entry in the hash table pages table and the context table pages table correspond to a page in the host memory **(Col. 26, line 46-47) complete set of TCB's exist in the host memory,** the host memory being in communication with the network interface controller **(Fig. 1, 35) storage in communication with (Fig. 1, 30) CPD.**

30.   Regarding Claim 30, Boucher discloses the invention as substantially claimed. Boucher further discloses the network interface controller is configured to issue a pre-fetch of the host context table cache line and the host hash table cache line **(Col. 67, lines 6-12).**

Claim Rejections - 35 USC § 103

31.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

32.   The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

     1.   Determining the scope and contents of the prior art.
     2.   Ascertaining the differences between the prior art and the claims at issue.
     3.   Resolving the level of ordinary skill in the pertinent art.
     4.   Considering objective evidence present in the application indicating
         obviousness or nonobviousness.

33.   Claims 4, 5, 8, 9, 13, 14, 26-29 are rejected under 35 U.S.C. 103(a) as being

obvious over Boucher in view of Bryg et al. (US Pat. No. 6393544) hereafter "Bryg".

34.   Regarding Claim 4, Boucher discloses the invention as substantially claimed.

However Boucher does not teach determine the host hash cache line and the host

context cache line using the physical address of the hash table page and the context

table page and an offset of the hash value within the hash table page and the context

table page, respectively.

35.   In the same field of endeavor, Bryg teaches, **(Col. 3, lines 27-38) using**

physical address , and the hash content, a cache line is determined by

translation.

36.   It would have been obvious to one of ordinary skill in the networking art at the

time the applicant's invention was made to combine Boucher's teachings as discussed

above with the teachings of Bryg, for the purpose of **(see BRYG, abstract, lines 32-33)**

reducing the amount of logic required to access page tables. Boucher provides

motivation to do so, by increasing the speed and efficiency of moving data being

communicated from a network **(see Boucher, Col.3, lines 41-44).**

37.   Regarding Claim 5, Boucher discloses the invention as substantially claimed.

However Boucher does not teach wherein upon initialization, the network interface

controller is configured with a set number of hash node entries in the hash table of the

host memory.

38.   In the same field of endeavor, Bryg teaches, **(Col. 4, lines 51-65) during**

initialization, the hash functions are set to allow virtual to physical translations to

proceed quickly.

39.   The same motivation as explained above applies equally as well to claim 5.

40.   Regarding Claim 8, Boucher discloses the invention as substantially claimed.

Boucher further discloses pre-fetching **(Col. 67, lines 6-12)**. However Boucher does not

teach a virtual host hash table cache line and a virtual host context table cache line.

41.   In the same field of endeavor, Bryg teaches, **(Col. 3, lines 29-38) virtual host**

hash and context tables.

42.   The same motivation as explained above applies equally as well to claim 8.

43.   Regarding Claim 9, Boucher-Bryg discloses the invention as substantially

claimed. Boucher further discloses the hashing logic is configured to generate the

hashing value from the context associated with the received packet **(Col. 10, lines 21-**

26) a hashing value is generated form the packet received form the network.

44.   Claim 13, lists all the same elements of claim 5, but in method form. Therefore,

the supporting rationale of the rejection to claim 5 applies equally as well to claim 13.

45.   Claim 14, lists all the same elements of claim 5, but in method form. Therefore,

the supporting rationale of the rejection to claim 5 applies equally as well to claim 14.

46.   Claim 18, lists all the same elements of claim 4, but in computer readable

medium form. Therefore, the supporting rationale of the rejection to claim 4 applies

equally as well to claim 18.

47.   Claim 19, lists all the same elements of claim 4, but in computer readable

medium form. Therefore, the supporting rationale of the rejection to claim 4 applies

equally as well to claim 19.

48.   Claim 26, lists all the same elements of claim 4. Therefore, the supporting

rationale of the rejection to claim 4 applies equally as well to claim 26.

49.   Claim 27, lists all the same elements of claim 4. Therefore, the supporting

rationale of the rejection to claim 4 applies equally as well to claim 27.

50.   Claim 28, lists all the same elements of claim 5. Therefore, the supporting

rationale of the rejection to claim 5 applies equally as well to claim 28.

51.   Claim 29, lists all the same elements of claim 5, but in method form. Therefore,

the supporting rationale of the rejection to claim 5 applies equally as well to claim 29.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure. Please refer to form PTO-892 (Notice of Reference Cited) for a list of
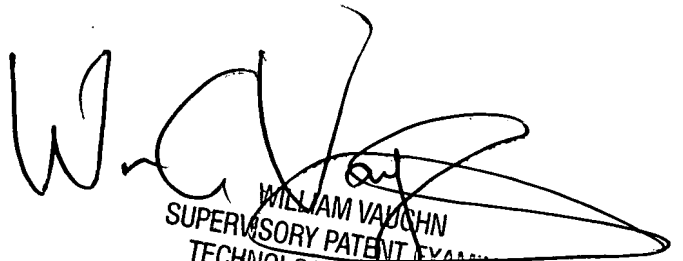
relevant prior art.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Saeed S. Mirzadegan whose telephone number is 571-

270-3044. The examiner can normally be reached on M-F 8:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, William Vaughn can be reached on 571-272-3922. The fax phone number

for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SSM

WILLIAM VAUGHN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100